

P a t e n t C l a i m s

5

1. Microcomponent connection system having an accomodation device for plate-shaped microcomponents and having a plurality of line connections which can be connected to the
10 microcomponent, characterised in that the microcomponent (7) and the line connections (8, 9, 16) can be pressed against one another by means of a lifting device (6).

2. Microcomponent connection system according to Claim 1,
15 characterised in that the microcomponent (7) can be pressed against the line connections (8, 9, 16) by means of a lifting device (6).

3. Microcomponent connection system according to Claim 1,
20 characterised in that the line connections (8, 9, 16) can be pressed against the microcomponent (7) by means of a lifting device (6).

4. Microcomponent connection system according to Claim 1,
25 characterised in that the lifting device (6) can be actuated manually by means of a cam, spindle or knee-lever mechanism.

5. Microcomponent connection system according to Claim 1,
30 characterised in that the lifting device (6) can be actuated by means of a controllable pneumatic cylinder, an electrically driven scissor jack or an electric spindle drive.

6. Microcomponent connection system according to Claim 1, characterised in that the microcomponent connection system (1) has a connection block (2) with line connections (8, 9, 16) passed through, and the microcomponent (7) can be pressed in the direction of the connection block (2) by means of the lifting device (6).

7. Microcomponent connection system according to Claim 4, characterised in that the microcomponent (7) accommodated in the accommodation device can be positioned by means of a frame (3) matched to the dimensions of the microcomponent (7).

8. Microcomponent connection system according to Claim 5, characterised in that the connection block (2), the frame (3) and the lifting device (6) form a slot open on one side in which the microcomponent (7) can be accommodated.

9. Microcomponent connection system according to Claim 1, characterised in that a coding of the microcomponent connection system (1) enables the alignment of accommodated microcomponents (7) matched thereto to be determined.

10. Microcomponent connection system according to Claim 7, characterised in that the microcomponent (7) has a recess, and the frame (3) of the microcomponent connection system (1) has a projection matched to the recess.

11. Microcomponent connection system according to Claim 1, characterised in that the accommodation device has electrical and fluid line connections (8, 9) for connection to the microcomponent (7).

12. Microcomponent connection system according to Claim 1, characterised in that the fluid line connections (9) each have a hollow ram (10).

5

13. Microcomponent connection system according to Claim 10, characterised in that the hollow ram (10) has a concentrically arranged sealing ring (11) around its aperture facing the accommodated microcomponent (7).

10

14. Microcomponent connection system according to Claim 10, characterised in that the hollow ram (10) is axially movable and spring-mounted.

15 15. Microcomponent connection system according to Claim 1, characterised in that the electrical line connections (8) have sprung electrical contacts (12).

16. Microcomponent connection system according to Claim 1, 20 characterised in that the electrical line connections (8) have spring-mounted electrical contacts (12).

17. Microcomponent connection system according to Claim 14, characterised in that the spring-mounted electrical con- 25 tacts (12) are designed as projecting, electrically conducting, spring-loaded telescope contacts.

18. Microcomponent connection system according to Claim 1, characterised in that the accommodation device has optical 30 line connections (16) for connection to the microcomponent (7).

- 27 -

19. Microcomponent connection system according to Claim 18, characterised in that the optical line connections (16) each have a hollow ram (10).
- 5 20. Microcomponent connection system according to Claim 18, characterised in that the hollow ram (10) has a concentrically arranged sealing ring (11) around its aperture facing the accommodated microcomponent (7).
- 10 21. Microcomponent connection system according to one of the preceding claims, characterised in that the hollow ram (10) is axially movable and spring-mounted.
22. Microcomponent connection system according to one of
15 the preceding claims, characterised in that the hollow ram (10) has a cone (21) at its end facing the accommodated microcomponent (7).
23. Microcomponent connection system according to Claim 22,
20 characterised in that the hollow ram (10) has a cone (21) of elastic material.
24. Microcomponent connection system according to Claim 18,
25 characterised in that an optical line connection (16) projects over a channel section (18) of the microcomponent (7) on opposite sides.
25. Microcomponent connection system according to Claim 18,
30 characterised in that a reflection layer (20) is arranged in the region of a channel section (18) on the opposite side of an optical line connection (16).

- 28 -

26. Microcomponent connection system according to Claim 18, characterised in that a light source is arranged in the region of a channel section (18) on the opposite side of an optical line connection (16).

5

27. Microcomponent connection system according to Claim 18, characterised in that an optical line connection (16) projects over a channel section (18) of the microcomponent (7) on opposite sides in such a way that an optical signal can
10 be transferred from one side of the optical line connection (16) through the channel section (18) to the other side of the optical line connection (16).

28. Microcomponent connection system according to Claim 1,
15 characterised in that the lifting device (6) has a support plate (6a) for the microcomponent, and the temperature of the support plate (6a) can be controlled by means of heating and/or cooling devices.

20 29. Microcomponent connection system according to Claim 1, characterised in that additional sensor elements, control elements or pneumatic line connections are integrated in the microcomponent connection system (1).

25 30. Microcomponent connection system according to Claim 1 or 29, characterised in that frits or membranes are arranged in the fluid (9) and/or pneumatic line connections.

30 31. Microcomponent connection system according to Claim 1, characterised in that a plurality of microcomponents (7) can be accommodated simultaneously and can each be con-

- 29 -

nected in parallel or series to associated line connections (8, 9, 16).

32. Microcomponent connection system according to Claim 1,
5 characterised in that a plurality of line connections (8, 9, 16) are connected to one another through connecting lines.

33. Use of a microcomponent connection system according to
10 one of Claims 1 to 32 for carrying out microfluid-controlled chemical reactions.

34. Use of a microcomponent connection system according to
one of Claims 1 to 32 for carrying out electrophoretic
15 separations and analyses of samples.

35. Use of a microcomponent connection system according to
one of Claims 1 to 32 for carrying out isotachophoretic
separations and analyses of samples.

20

36. Use of a microcomponent connection system according to
one of Claims 1 to 32 for carrying out polymerase chain
reactions (PCR reactions) in samples.

25 37. Use of a microcomponent connection system according to
one of Claims 1 to 32 for the distribution of sample material over a plurality of microcomponents.

38. Use of a microcomponent connection system according to
30 one of Claims 1 to 32 for the collection of separated fractions of sample material after a chromatographic separation.